

### ABSTRACT OF THE DISCLOSURE

A new capping multilayer structure for EUV-reflective Mo/Si multilayers consists of two layers: A top layer that protects the multilayer structure from the environment and a bottom layer that acts as a diffusion barrier between the top layer and the structure beneath. One embodiment combines a first layer of Ru with a second layer of B<sub>4</sub>C. Another embodiment combines a first layer of Ru with a second layer of Mo. These embodiments have the additional advantage that the reflectivity is also enhanced. Ru has the best oxidation resistance of all materials investigated so far. B<sub>4</sub>C is an excellent barrier against silicide formation while the silicide layer formed at the Si boundary is well controlled.